

Revision of the *Chiloglanis* (Pisces: Mochokidae) of Southern Africa and descriptions of two new species

PART 1: Limpopo, Incomati and Pongola rivers

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Until Crass (1960: 445—456) published detailed descriptions of *Chiloglanis* species found in the inland waters of Natal little was known of the representatives of this genus in southern Africa. Further systematic collecting has been carried out since that date and it is now possible to review the *Chiloglanis* of this region. This section is devoted to the *Chiloglanis* of the Limpopo, Incomati and Pongola River systems collected by personnel of the Lydenburg Provincial Fisheries Institute, Dr. U. de V. Pienaar of the Kruger National Park, Mr. R. S. Crass and Mr. B. G. Donnelly.

With abundant material available the authors have found that the *Chiloglanis* of this southern region can be divided into four distinct groups by the character and maximum number of mandibular teeth, the maximum number of mandibular teeth in each case being that of a complete row, whether functional or replacement teeth. This grouping can be extended also to Zambezi River material, see Figure 11, which will be discussed in a subsequent paper. Based on this grouping and other characteristics the following key to their identification has been prepared:

Key to the identification of the *Chiloglanis* of the Limpopo, Incomati and Pongola River systems.

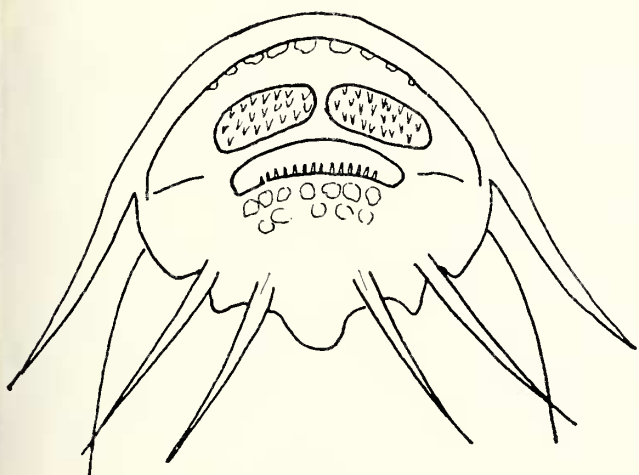


Fig. 1.

1. Mandibular teeth short, up to 14 in number widely spaced, width of band 40—50% of width of inside of mouth; maxillary and mandibular barbels long; dorsal spine not serrated:

C. swierstrai v. d. Horst.

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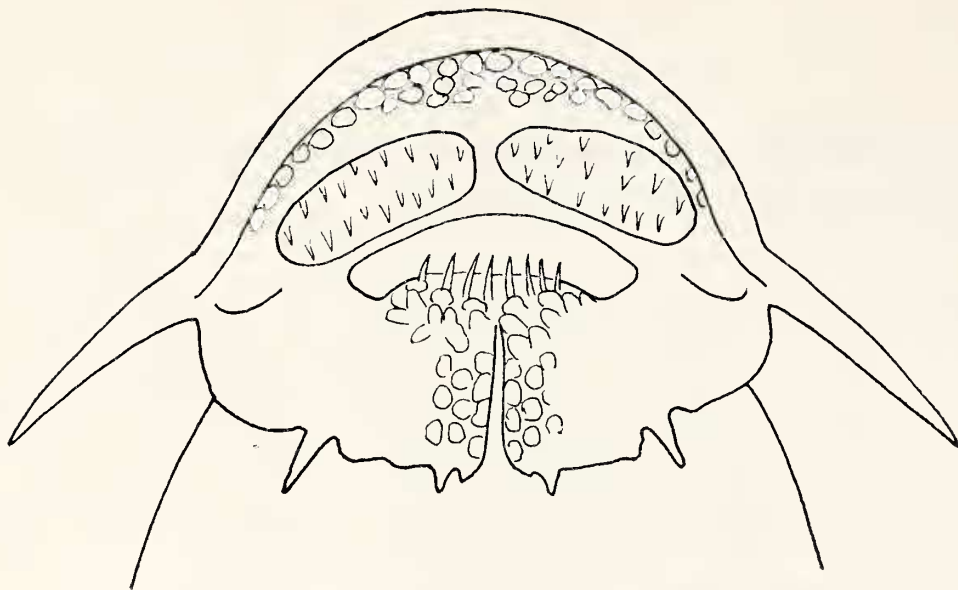


Fig. 2.

2. Mandibular teeth long, up to 8 in number widely spaced, width of band 25—40% of width of inside of mouth; dorsal spine not serrated:

(a) Mandibular barbels short, caudal forked, the upper lobe often larger than the lower:

C. bifurcus sp. nov.

(b) Mandibular barbels long, caudal emarginate:

C. emarginatus sp. nov.

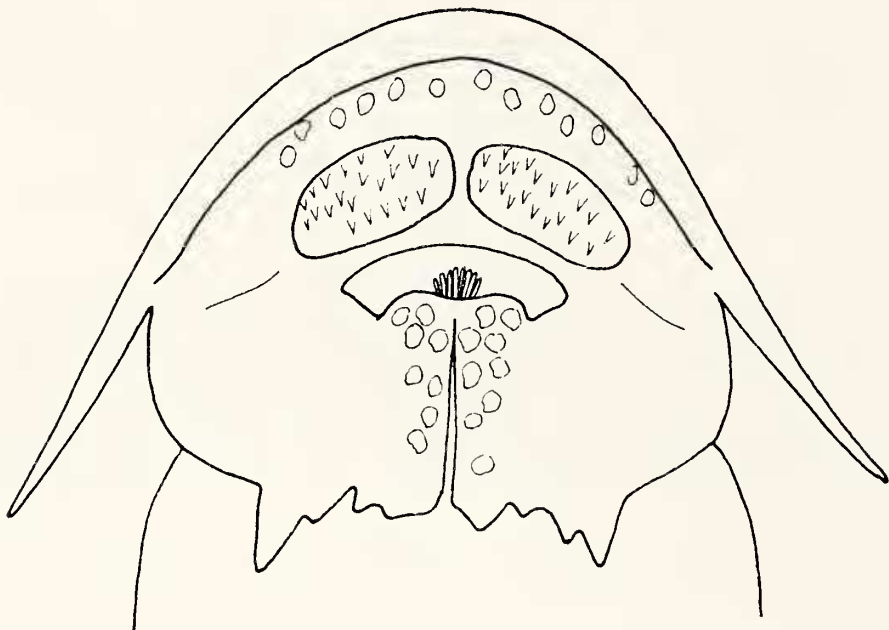


Fig. 3.

3. Mandibular teeth long, slender, up to 12 in number closely spaced at base, width of band at base 20—30% of width of inside of mouth; dorsal spine serrated:

C. paratus Crass.

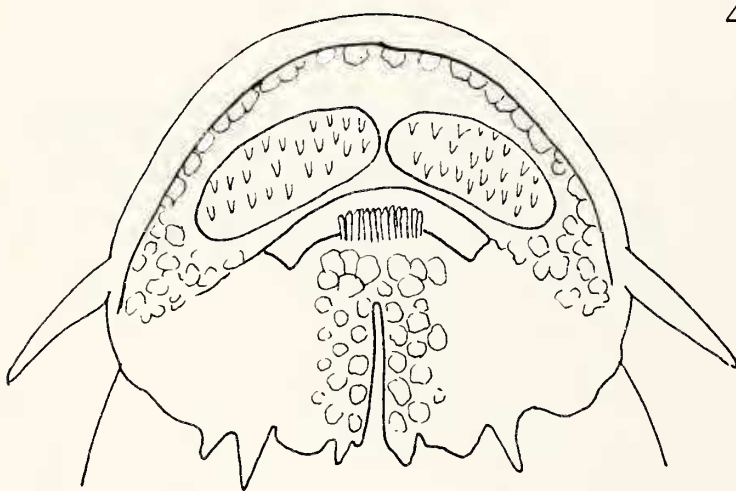


Fig. 4.

4. Mandibular teeth long, up to 12 in number closely spaced, width of band 30—40% of width of inside of mouth; dorsal spine not serrated:

(a) Mature males with median rays of caudal fin elongated; females emarginate:

C. anoterus Crass.

(b) Males and females with emarginate caudal fins; dorsal spine length variable, 12—15% of standard length in Limpopo populations, 5—10% of standard length in Incomati River populations:

C. pretoriae v. d. Horst.

Chiloglanis swierstrai v. d. Horst, 1931. (Fig. 5).

1931: v. d. Horst, p. 249, Fig. 3.

1960: Crass, pp. 247, 451, text-fig. 3. *C. engiops*. **syn. nov.**

1964: Crass, p. 94, Fig. 23, F & G, *C. engiops*.

1967: Jubb, p. 147, Fig. 165.

1968: le Roux & Steyn, pp. 85—6.

1968: Pienaar, p. 53, Fig. 31.

Crass' *C. engiops* was based on material from the Pongola River only, no specimens from rivers to the north of this system having been collected at that time. Due to pollution of the upper reaches of the Crocodile, Pretoria District, it has not been possible to obtain specimens of *C. swierstrai* from the type locality, but, it has been possible to compare material from the Elands River, Limpopo system, and the Incomati River system with *C. engiops* from the Pongola River and the type specimen of *C. swierstrai*, Transvaal Museum No. 8655. This latter specimen is in poor condition but from this study it is considered that *C. engiops* is a synonym.

DISTRIBUTION: Usually below 3,000 feet in pools and backwaters of the Pongola and Incomati River systems, and those tributaries of the Limpopo River which rise in the Transvaal.

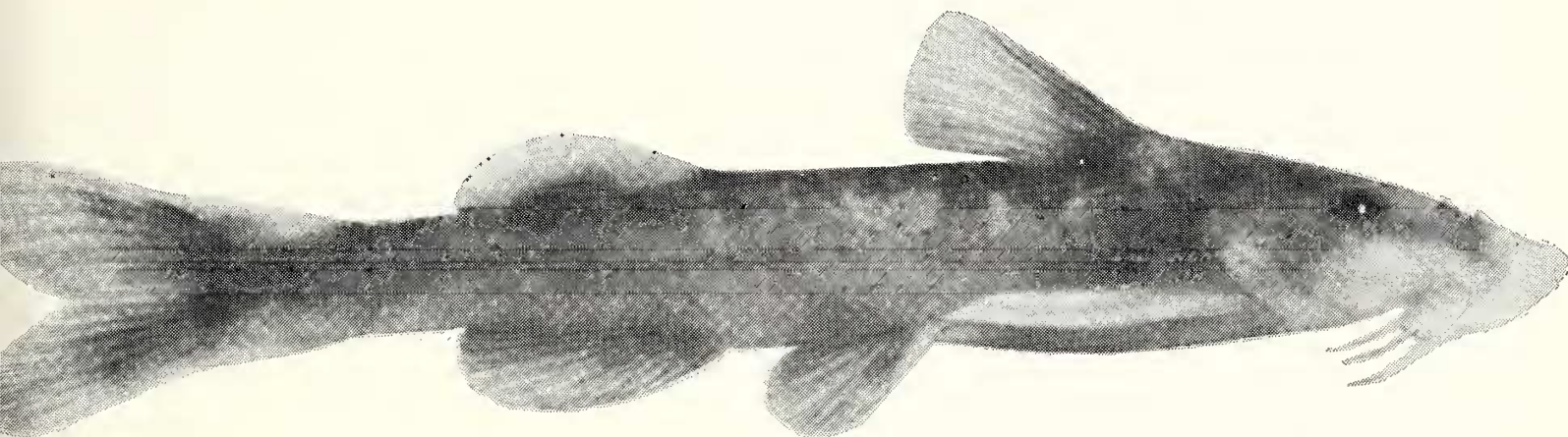


Fig. 5. *Chiloglanis swierstrai* ($\times 2$).

Chiloglanis paratus Crass, 1960. (Fig. 6).

1960: Crass, pp. 452—456, text-fig. 4.

1964: Crass, p. 96, Fig. 23, D & E.

1967: Jubb, p. 145, Fig. 163.

1968: le Roux & Steyn, pp. 83—4.

1968: Pienaar, P. 54, Fig. 32.

Crass' (1960) text-fig. 4 (*d*) illustrates clearly the arrangement and character of the mandibular teeth.

DISTRIBUTION: This species has been collected from the Incomati River system and the Pongola River system. Specimens have been collected by B. G. Donnelly from the Limpopo River near Tuli which is upstream of Beitbridge. I. G. Gaigher has also collected *C. paratus* from the Limpopo system but it is not common.

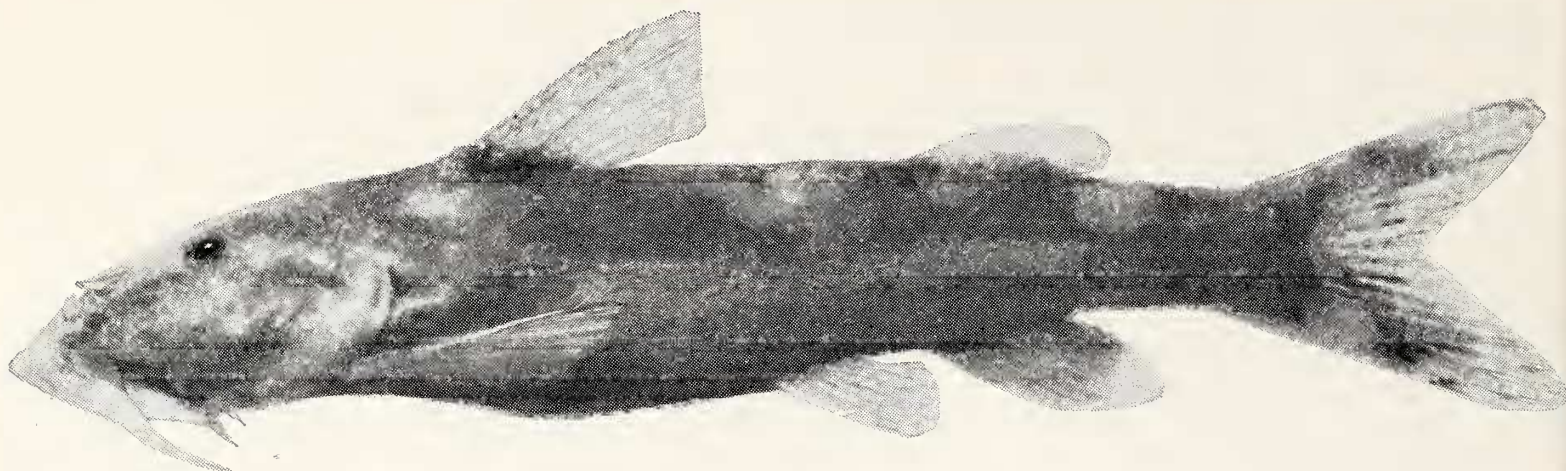


Fig. 6. *Chiloglanis paratus* ($\times 2$).

Chiloglanis pretoriae v. d. Horst, 1931. (Fig. 7).

1931: v. d. Horst, p. 248, Fig. 2.

1931: v. d. Horst, p. 250, Fig. 4: *C. pumilus*. **syn. nov.**

1960: Crass, p. 447, pp. 450—1.

1967: Jubb, p. 145, Figs. 160 & 162 (*C. pumilus* v. d. Horst).

1968: Pienaar, p. 55, Fig. 33.

1968: le Roux, pp. 83—86.

A variable species throughout its distribution. Limpopo River populations have a dorsal spine length of 12—15% of the standard length, the dorsal spine length being shorter in specimens from the Blyde River, and very short in specimens from the Incomati River system where the dorsal spine is only 5—10% of the standard length.

The type specimen of *C. pretoriae* cannot be found but a type specimen of *C. pumilus*, Transvaal Museum No. T.M. 8655, has been examined by the authors. It is considered that this is a half-grown specimen of *C. pretoriae*.

DISTRIBUTION: Tributaries of the Limpopo River system, both in Rhodesia and the Transvaal, as well as tributaries of the Incomati River.

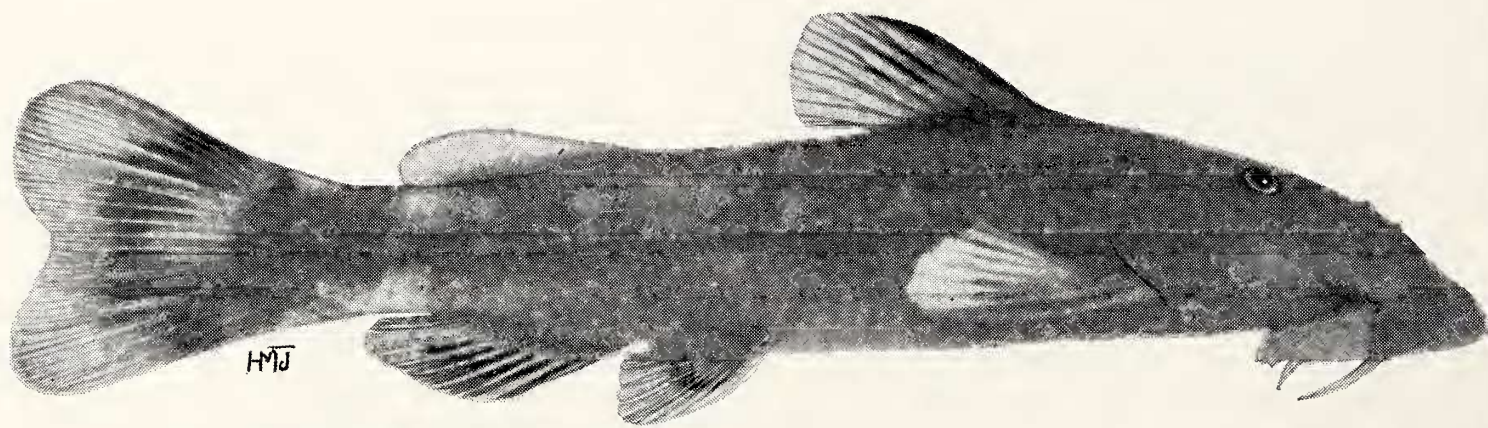


Fig. 7. *Chiloglanis pretoriae* ($\times 2.3$).

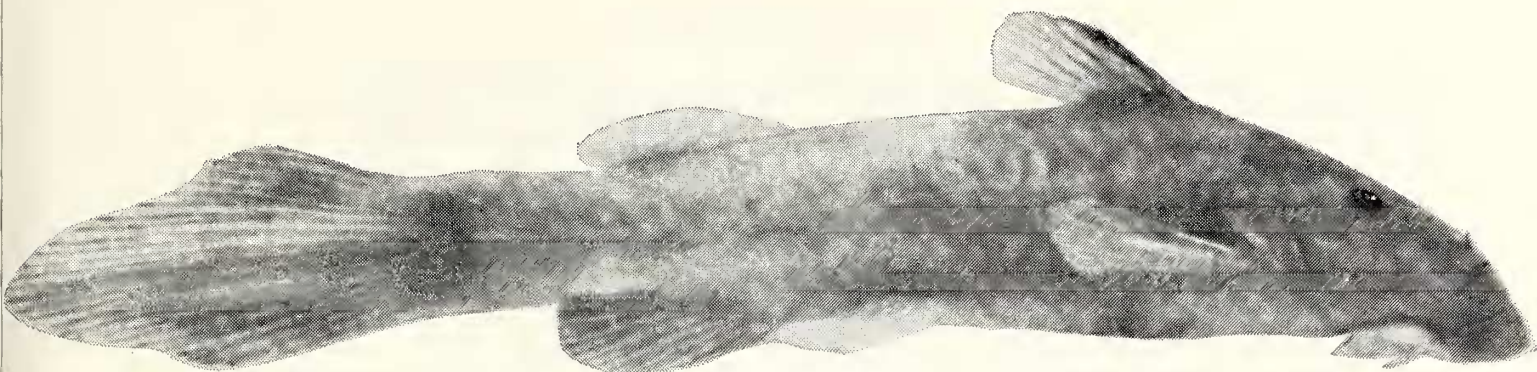


Fig. 8. *Chiloglanis anoterus* ($\times 2$).

Chiloglanis anoterus Crass, 1960. (Fig. 8).

1960: Crass, pp. 446—450, text-fig. 2.

1964: Crass, p. 94, Fig. 23, A, B & C.

1967: Jubb, p. 145, Fig. 161, A & B.

1968: Pienaar, p. 51, Fig. 30.

1968: le Roux, pp. 83—84, distribution map.

A species of the upper reaches of tributaries of the Pongola and Incomati River systems which is closely allied to *C. pretoriae*. It differs from this species chiefly in the form of the caudal fin, the median rays of the caudal fin of mature males being elongated to give the fin a pennant-like appearance. This elongation of the median rays is not always symmetrical and is barely noticeable in some specimens. Females of this species do not have the median rays elongated and it is not possible, without knowing the origin of the specimens, to separate female *C. anoterus* from female *C. pretoriae*. It is, however, possible to separate female *C. anoterus* from females of the Incomati River form of *C. pretoriae* as the latter tend to have shorter dorsal spines. Work by Gaigher, as yet unpublished, on the distribution of fishes in the Incomati River system, indicates that there may be some ecological separation between the two species as males of *C. anoterus* and the Incomati River form of *C. pretoriae* do not occur together. Both species show a preference for rocks in flowing water.

DISTRIBUTION: Parts of the Incomati and Pongola River systems.

Chiloglanis bifurcus sp. nov.

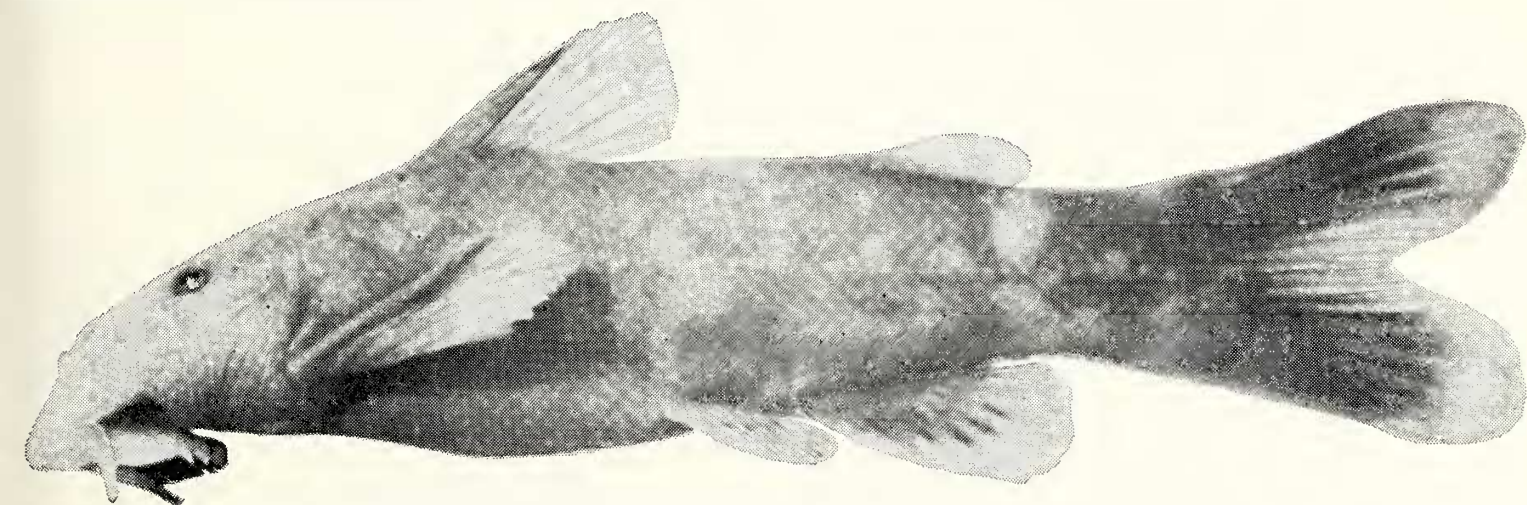


Fig. 9. *Chiloglanis bifurcus* sp. nov. Std. length 68 mm. Type specimen.

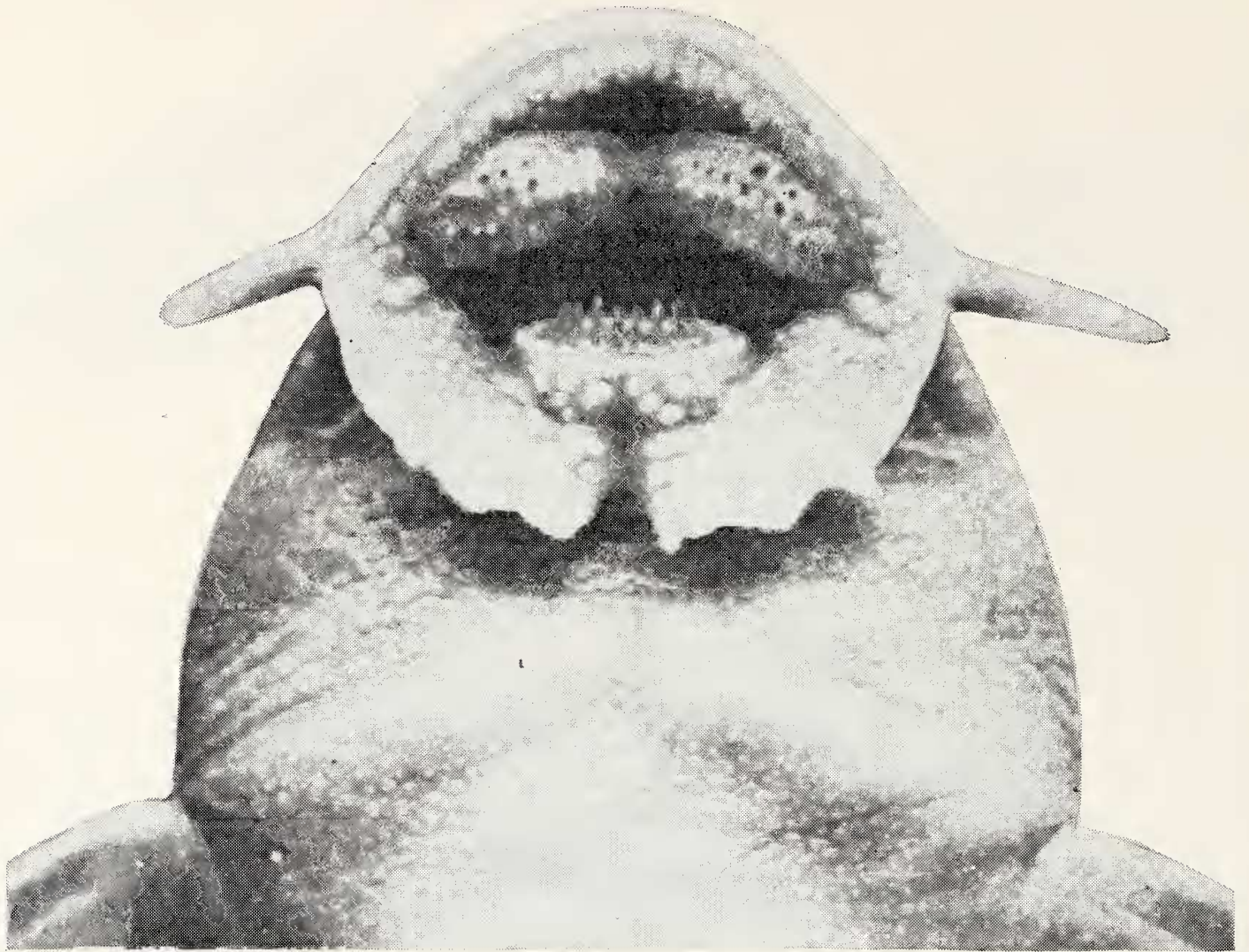


Fig. 9A. Enlarged ventral view of mouth of type specimen of *C. bifurcus*.

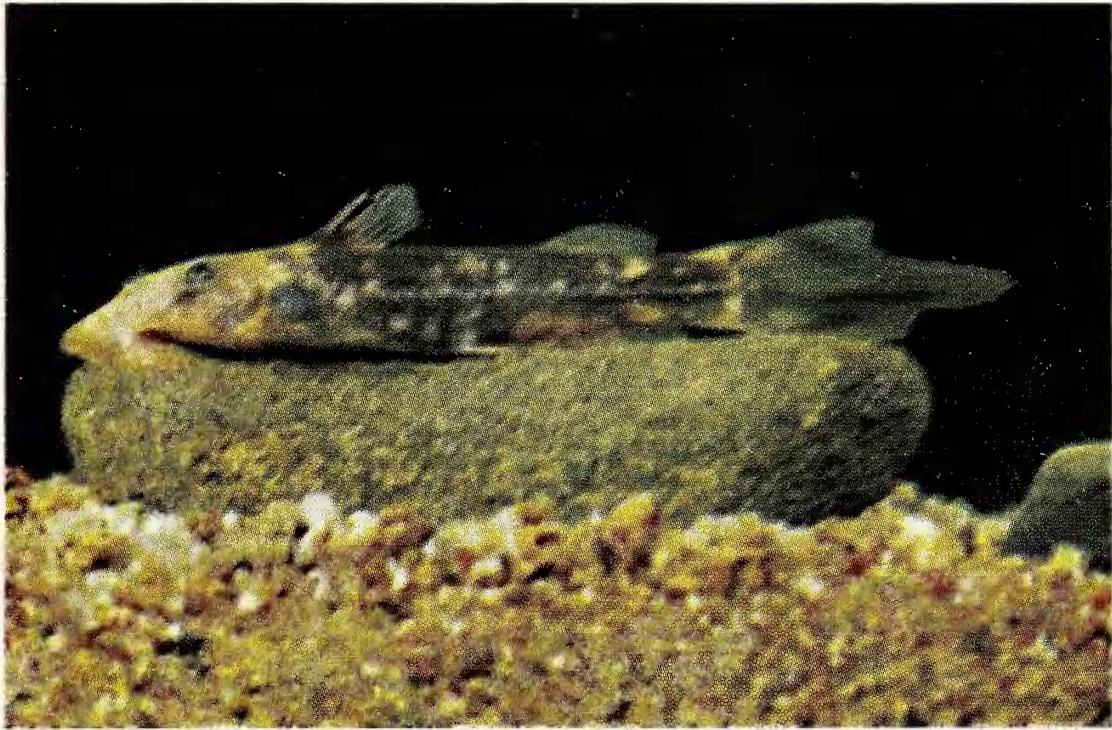
HOLOTYPE: Male. Std. Length 68 mm., fork length 76 mm. Collected by I. G. Gaigher on 14th September, 1965, from the Crocodile River, Incomati River system, Montrose Farm, Nelspruit District. Lydenburg Provincial Fisheries Institute No. P.F. 348, Albany Museum No. P.F. 996.

DESCRIPTION: From type specimen and nine paratypes selected from Lydenburg Provincial Fisheries Institute specimens Nos. P.F. 67/2B, Elands River, and 67/16B, Crocodile River, Incomati River system, collected by I. G. Gaigher, Albany Museum No. P.F. 997.

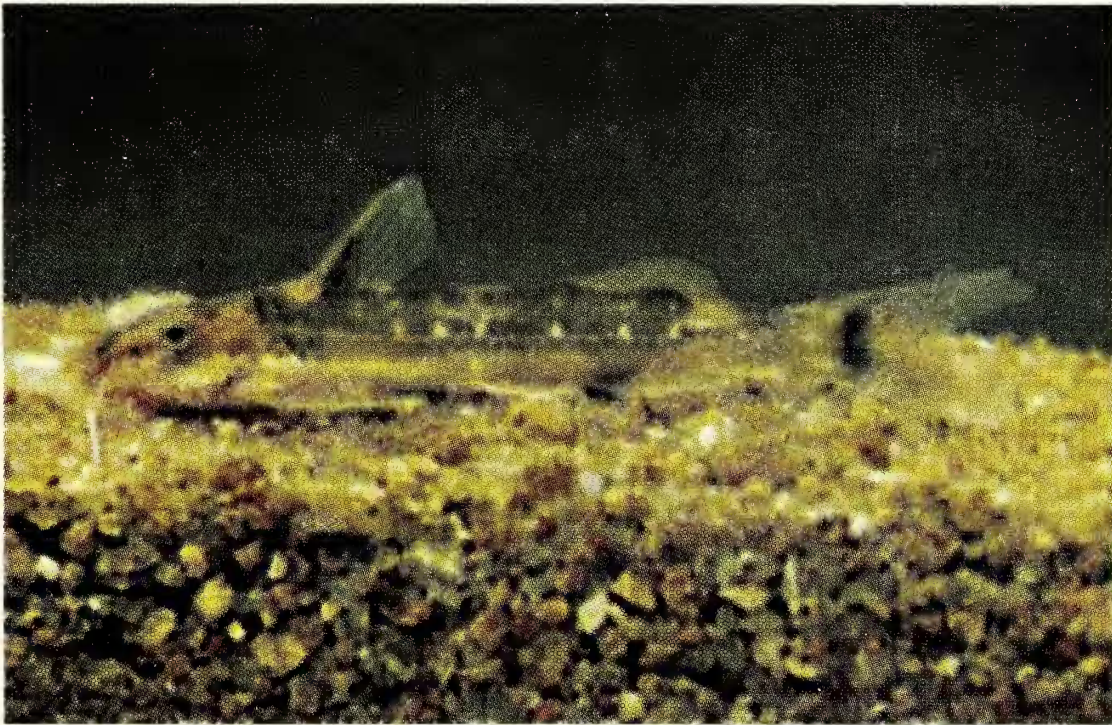
All measurements taken direct using calipers or dividers, the head length being taken as from the top of the gill opening to the tip of the snout. The value in parenthesis is that of the type specimen.

In percentage of standard length: Length of head 27—29 (29); length of snout 17—19 (19); snout to origin of dorsal fin 36—40 (40); snout to origin of adipose fin 68—73 (73); snout to origin of anal fin 65—68 (65); posterior base of dorsal fin to origin of adipose fin 20—26 (23); length of dorsal spine 12—16 (16); length of pectoral spine 16—20 (19); length of base of adipose fin 11—14 (12).

In percentage of head length: Snout length 59—65 (65); length of maxillary barbel 25—41 (25); length of outer mandibular barbel 9—14 (9); eye 12—15 (15); interorbital width 27—31 (28).



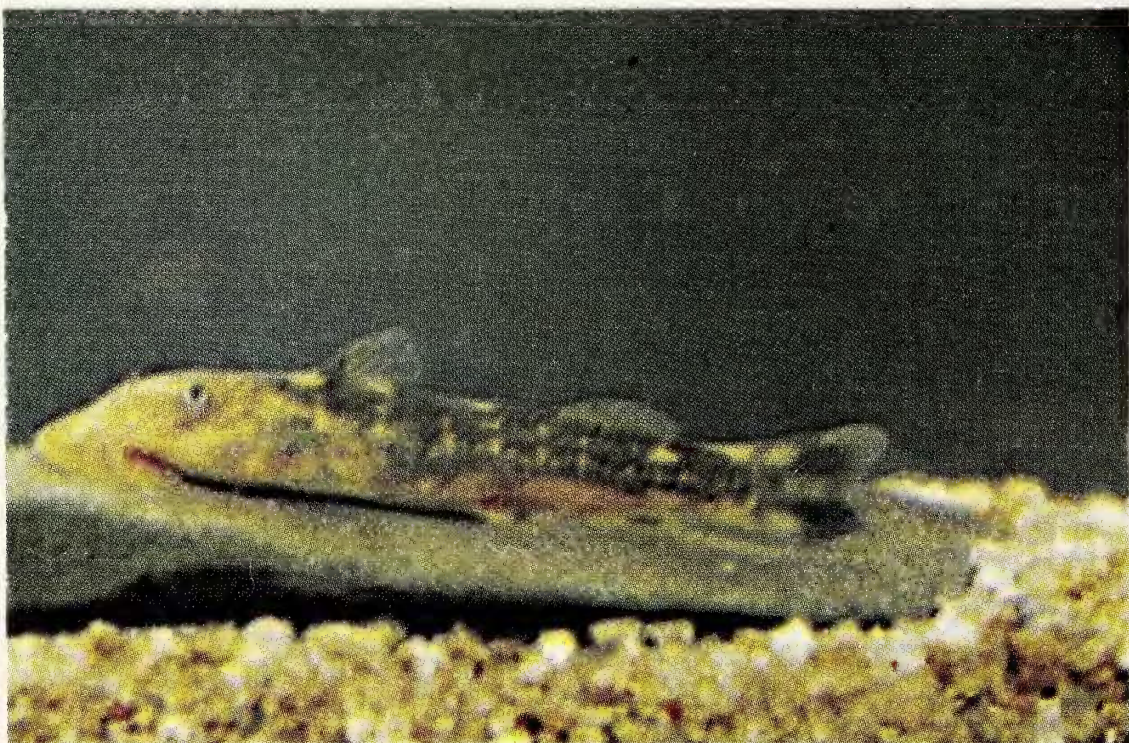
30. *Chiloglanis anoterus* Crass, 1960.
Penant-tailed dwarf catfish or rock catlet.
Wimpelstert-suierbekbaber.



31. *Chiloglanis swierstrai* v.d. Horst, 1931.
Synonym: *C. engiops* Crass, 1960.
Bearded or Slender dwarf catfish.
Langbaard- of Bont-suierbekbaber.



32. *Chiloglanis paratus* Crass, 1960.
Spiny dwarf catfish or rock catlet.
Swart of Gestekelde suierbekbaber.



33. *Chiloglanis* sp. cf. *C. pretoriae* v.d. Horst, 1931.
Lesser dwarf catfish. Kleinste suierbekbaber.

A ventral view of the mouth is shown in figure 9A of the type specimen. The paratypes, which are smaller specimens, have longer maxillary and mandibular barbels. The long, widely-spaced teeth, eight in number, which curve inwards are clearly visible. Compare the character of these teeth with those of *C. pretoriae* shown in figure 10, and those of a common Zambezi River species, *C. cf. neumanni* Boulenger illustrated in figure 11. In this latter example it will be seen that the teeth are minute, the width of the band being approximately 10—13%

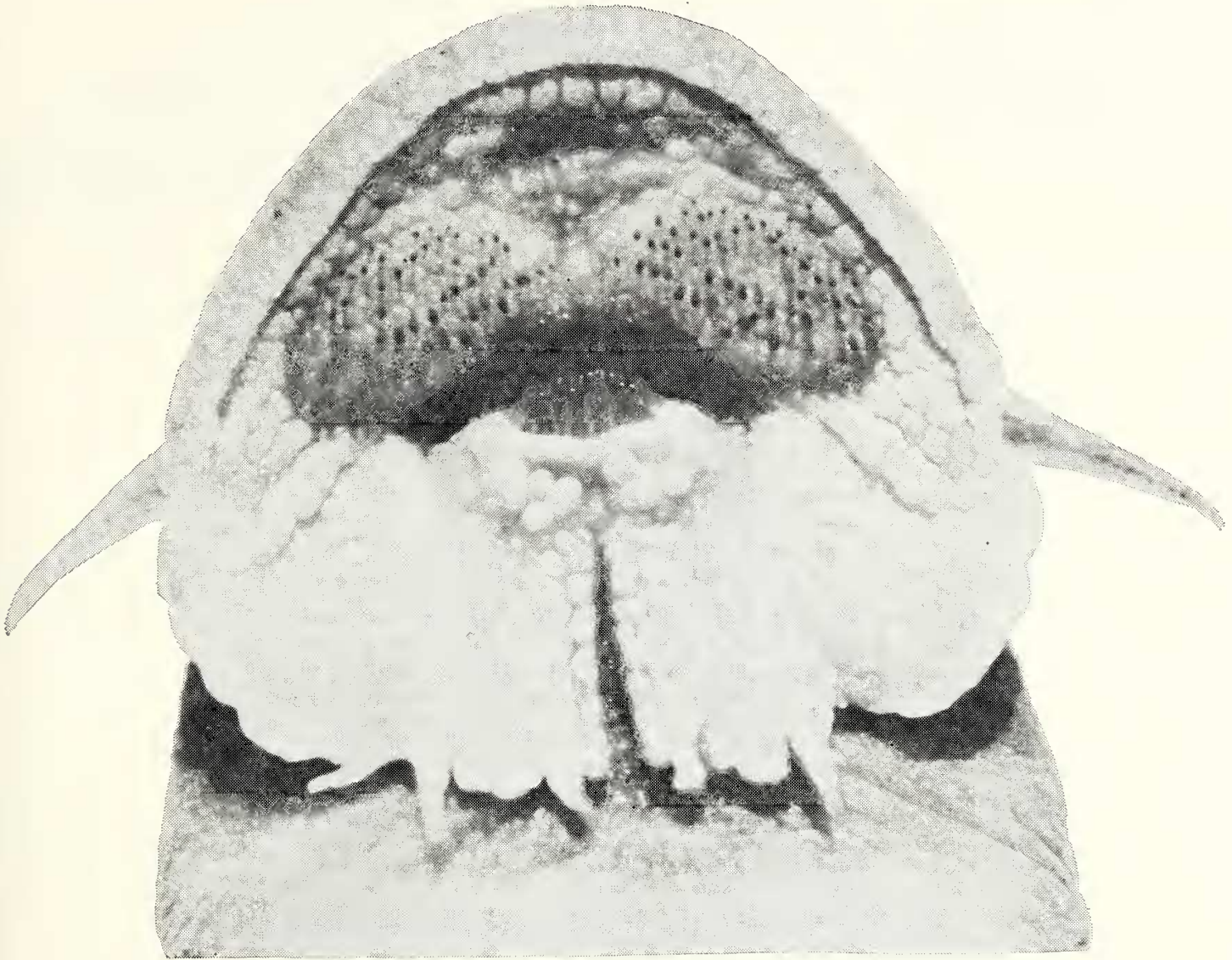


Fig. 10. Ventral view of mouth of a specimen of *C. pretoriae* showing functional and replacement teeth.

of the inner width of the mouth. The mouth of *C. bifurcus* is surrounded by a large circular, papillose lip, thickened anteriorly and posteriorly divided down the midline. The premaxillary teeth, on two large oval pads separated at the midline, are pointed, widely spaced and form three transverse series. The vomerine teeth, separated from the premaxillary teeth, are variable in number and position.

Dorsal fin I 6, the spine, not serrated, 12—16% of the standard length. Anal fin III 8. Caudal fin forked, the upper lobe in many specimens being larger than the lower.

COLOUR: Dorsal surface olive light brown with light olive blotches, pale on ventral surface. There is a distinct pale mid-lateral line. Fins colourless except for caudal, anal and ventral fins which have some rays pigmented, these pigmented areas being more accentuated in specimens preserved in formalin. The skin is rugose and covered with minute protuberances which appear white in preserved material.

FOOD: The large sucker-like mouth is well adapted for clinging to rock surfaces. Gut contents indicate that these small fishes feed on epiphytic flora and associated fauna found on rocks in running water, aquatic insect larvae being predominant. Some specimens contained the empty shells of small molluscs.

HABITAT: During his surveys Gaigher found this species to be associated with rapids in perennial streams, and to be absent from pools or annual streams.

BREEDING HABITS: Maturity is reached at a size of about 25 mm. standard length. It is not known where these fish spawn but ripe females were collected during the month of January.

DISTRIBUTION: This new species has been found only in the Elands and Crocodile rivers, tributaries of the Incomati River.

The specific name *bifurcus* refers to the shape of the caudal fin which is forked with large lobes.

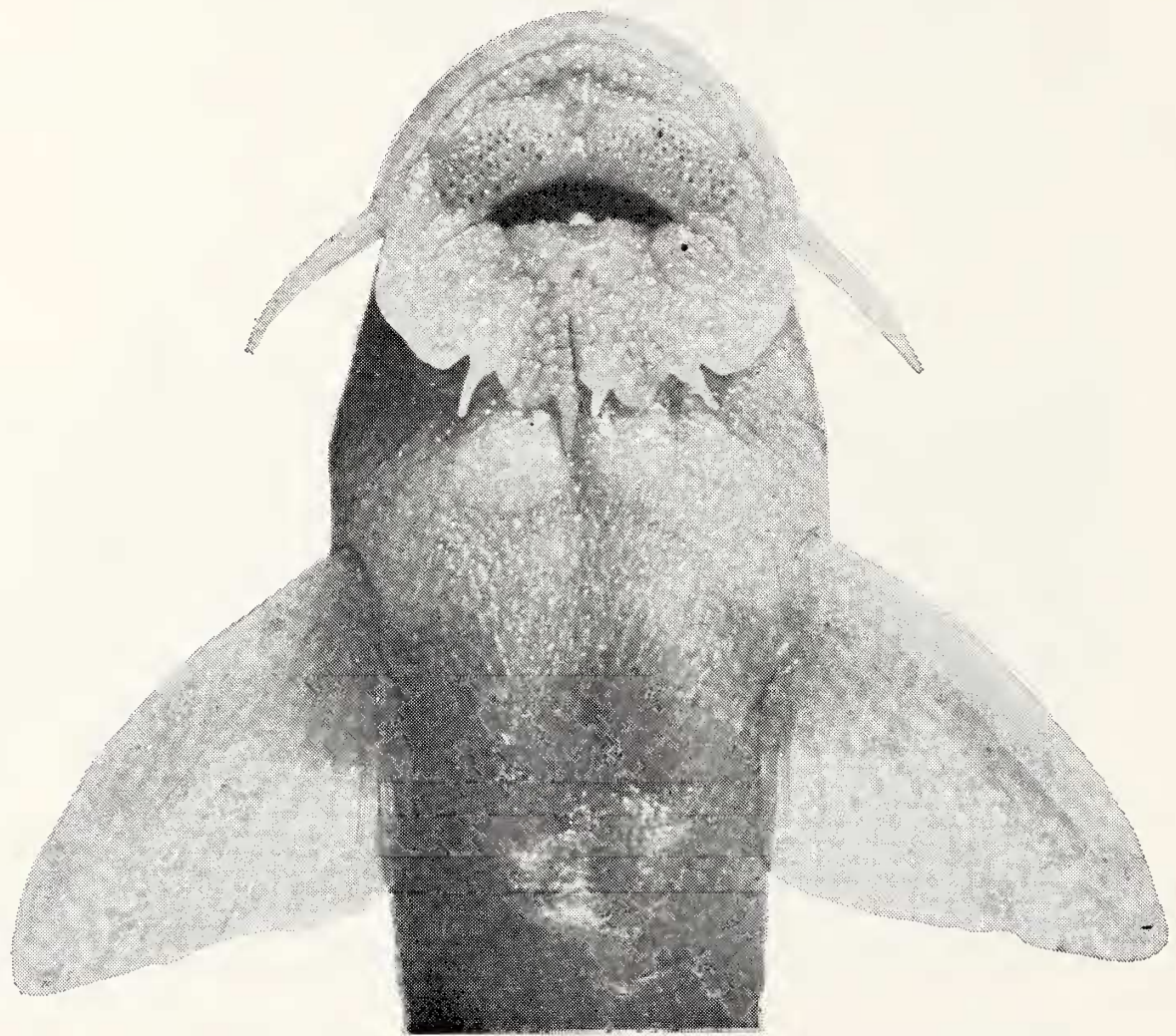


Fig. 11. Ventral view of mouth of a specimen of *C. cf. neumanni*, Middle Zambezi system. Note relatively narrow band of small teeth.

Chiloglanis emarginatus sp. nov.

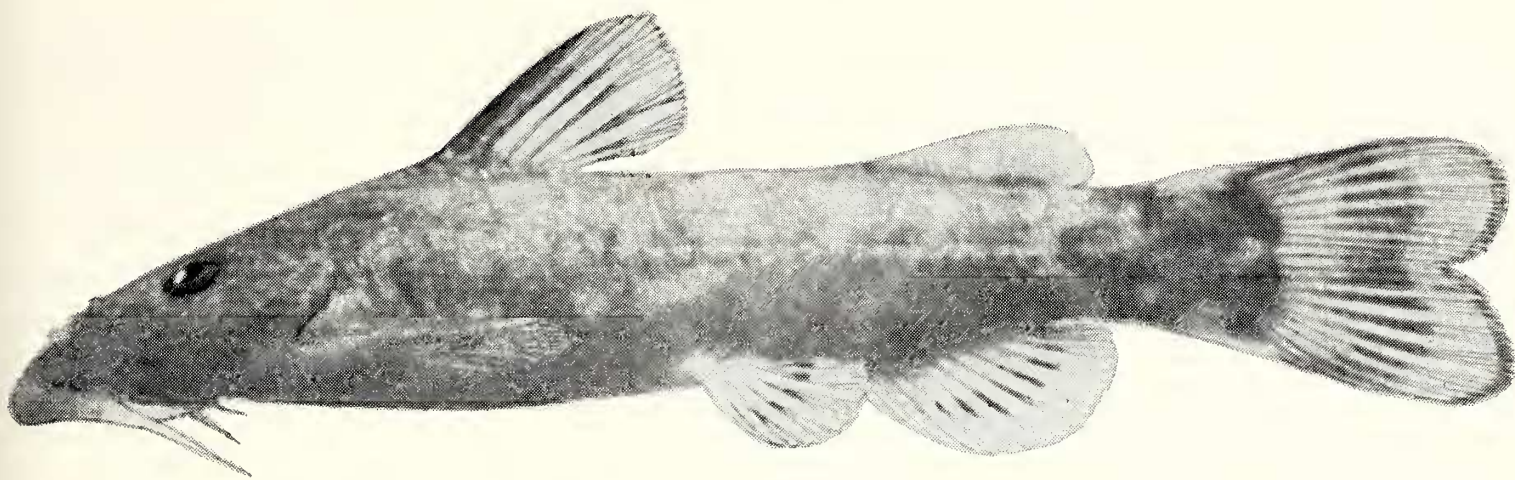


Fig. 12. *Chiloglanis emarginatus* sp. nov. Type specimen Std. length 57.5 mm.

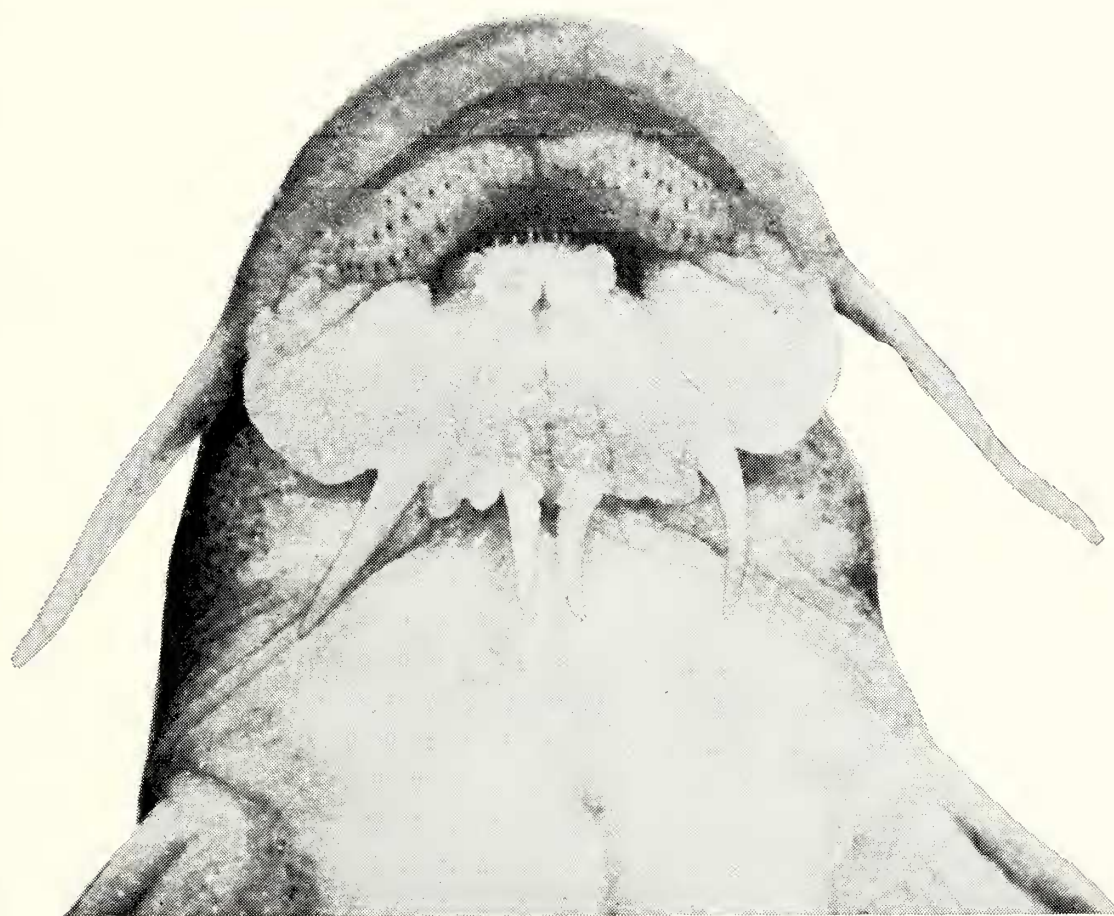


Fig. 12A. Enlarged ventral view of mouth of type specimen of *C. emarginatus*.

HOLOTYPE: Female. Std. length 57·5 mm., fork length 65·0 mm. Collected by I. G. Gaigher on 15th May, 1967, from Lekkerloop River, tributary of the Komati River of the Incomati River system, on the farm Vergelegen, Carolina District. Provincial Fisheries Institute, Lydenburg, No. P.F. 532, Albany Museum No. P.F. 953.

DESCRIPTION: From the type and nine paratypes, some of the latter taken from P.F. M/67/14 collected by I. G. Gaigher on the 12th January, 1967, from the Komati River, on the farm Vlakfontein, Carolina District. Albany Museum No. 954.

In percentage of standard length, values in parentheses being that of the type specimen: Fork length 109—113 (113); head length 26—28 (28); snout length 15—18 (16); snout to origin of dorsal fin 36—38 (36); snout to origin of adipose fin 63—69 (69); snout to origin of anal fin 63—67 (65); posterior base of dorsal fin to origin of adipose fin 20—23 (23); length of dorsal spine 15—19 (17); length of pectoral spine 17—19 (19); length of adipose fin base 16—19 (17).

In percentage of head length: Snout length 54—69 (56); pectoral spine 59—71 (69); maxillary barbels 37—57 (50); outer mandibular barbels 13—28 (20); width of eye 15—21 (16); inter-orbital width 23—32 (25).

A ventral view of the mouth of the type specimen is shown in figure 12A. This illustrates the difference in the general shape of the mouths of these two species. The teeth, which are not as robust as those of *C. bifurcus* are widely spaced also, the maximum number in a complete number being eight and the band width 25—35% of the inner width of the mouth. The premaxillary teeth, on two large oval pads separated at the midline, are pointed, widely spaced and form three transverse series. The vomerine teeth, separated from the premaxillary teeth, are variable in number and position. Both the maxillary and mandibular barbels are longer than those of *C. bifurcus*.

Dorsal fin I 6, the spine, not serrated, 15—19% of the standard length. Anal fin III 8, caudal fin emarginate.

COLOUR: Dorsal surface olive light brown with light olive blotches, pale on ventral surface. There is a distinct pale mid-lateral line. Fins colourless except for caudal, anal and ventral fins which have pigment on rays forming bars along the middle of each fin. The skin is rugose and covered with minute protuberances which appear white in specimens preserved in formalin.

FOOD: Feed on fauna associated with epiphytic flora found on rocks in perennial streams. Gut contents were found to contain remains of epiphytic algae and aquatic insect larvae, the type specimen being engorged with *Simulium* larvae.

HABITAT: Lives amongst rocks, usually associated with rapids, in perennial streams.

BREEDING HABITS: Maturity is reached at a standard length of about 25 mm. It is not known where these fish spawn. Females collected by Gaigher in May 1967 have ovaries forming, but those collected during January the same year were found to be ripe and ready for spawning.

DISTRIBUTION: *C. emarginatus* has been collected by R. Pott in tributaries of the Pongola River system in the Paulpietersburg District, and a single specimen from the Pungwe River, Inyanga District, Rhodesia, was submitted by D. H. Plowes of Umtali. From this it would appear that *C. emarginatus* occurs in rocky, perennial tributaries of east-flowing rivers from the Pongola northwards to the Pungwe River of the Inyanga Mountains, Rhodesia.

The specific name *emarginatus* refers to the shape of the caudal fin of this new species.

AFFINITIES: Both Dr. Max Poll, *Musée Royal du Congo Belge*, Tervuren, Belgium, and Mr. James Chambers of the British Museum (Natural History), London, have provided the authors with minute details regarding the dentition of type specimens of *Chiloglanis* housed in their respective museums. It has not been possible to correlate *C. bifurcus* or *C. emarginatus* with any species of *Chiloglanis* described from north of the Zambezi River system, or with material supplied by G. Bell-Cross, Game and Fisheries Department, Chilanga, Zambia. Beyond what is published it has not been possible to obtain further details about Pellegrin's (1936) *Chiloglanis fasciatus* described from the upper Okavango River, and no additional material is available from this area. In his description Pellegrin considers *C. fasciatus*, mandibular teeth 14, to be related to *C. pretoriae*.

Both *C. bifurcus* and *C. emarginatus* can be separated from known *Chiloglanis* of the Limpopo, Incomati and Pongola rivers by their mandibular dentition. From one another *C. emarginatus* can be distinguished by its longer maxillary and mandibular barbels, its longer adipose fin base and emarginate caudal fin. In addition to these characteristics *C. bifurcus* is a more robust species with a broader pectoral girdle when specimens of a similar standard length are compared.

ACKNOWLEDGEMENTS

Research work carried out by the senior author, a Research Associate of the Albany Museum, Grahamstown, is sponsored by the Council for Scientific and Industrial Research, Pretoria.

The authors are indebted to the Director, Department of Nature Conservation, Pretoria, for permitting material collected by Messrs. Gaigher and Pott, of the Lydenburg Provincial Fisheries Institute, to be supplied for this investigation, and to Mr. R. S. Crass, Senior Research Officer, Natal Parks, Game and Fish Preservation Board, Pietermaritzburg, for supplying material from Natal rivers. Distribution records were completed by material supplied by Mr. B. G. Donnelly, Rhodesia, Mr. D. H. Plowes through the Umtali Museum, Rhodesia, and Mr. G. Bell-Cross, Game and Fisheries Department, Chilanga, Rhodesia.

Dr. Max Poll supplied taxonomical data relating to Angola and Congo species, and Mr. James Chambers data relating to type material in the British Museum (Natural History).

This paper is published by courtesy of the Director of the Albany Museum, Mr. C. F. Jacot Guillarmod. The four colour plates appended were taken from Pienaar's (1968) Freshwater Fishes of the Kruger National Park by kind permission of the Director, National Parks Board, Pretoria, and the illustrations for this paper prepared by Mrs. H. M. Jubb.

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